

alkaline seas, as might have been expected from its comparatively low-salinity and temperature. Within the gulf, however, the pH from station to station does not correspond to the differences in salinity or in temperature; neither have I been able to find any definite parallelism between the pH and the abundance of diatoms—certainly no decided rise even at the times and stations when these pelagic plants are flowering most freely. In short, the volume of water is too large and its circulation too free for any given flowering to reflect its active photosynthesis by an appreciable local rise in pH.

The fact that in March the deeper of two samples was in several cases the more alkaline, but that in May the reverse was true, may be significant, the phytoplankton being most abundant in the well-illuminated strata near the surface. It is not improbable, also, that a larger number of observations carried out through the year would reveal a seasonal fluctuation of pH, with the maximum in early spring and summer following the vernal flowerings of diatoms and the summer multiplication of peridinians, such as occurs in the Irish Sea<sup>23</sup> (Moore, Prideaux, and Herdman, 1915; Bruce, 1924).

### VISUAL TRANSPARENCY

Measurements of the transparency of the water were taken at 18 stations during the summer of 1912 with the ordinary "Secchi" disk—a metal plate 14 inches in diameter, painted white, and rigged with a bridle, so that it hangs horizontal. This is viewed through a water glass<sup>24</sup> while being lowered, and the depth at which it disappears from view is recorded.

In the clearest water the disk was visible to 8.2 fathoms, but at most of the stations it disappeared at 4 to 5 fathoms. Local variations in transparency did not parallel the variations in color (p. 823), for while the water was most transparent when bluest, it was not least so where greenest, but where the percentage of yellow was only 20 (station 10038).

The transparency does not measure the penetration of sunlight, for water cloudy with silt or with diatoms may still be translucent, like ground or opal glass, though transparent to only a small degree.

#### *Transparency, in meters*

Date, 1912	Station	Transparency	Date, 1912	Station	Transparency
July 11.....	10004	6.4	Aug. 15.....	10031	7.3
July 17.....	10011	11	Aug. 20.....	10036	7.3
July 23.....	10012b	11	Aug. 21.....	10037	7.3
July 24.....	10014	11	Aug. 22.....	10038	5.5
July 25.....	10015	8.2	Do.....	10039	11
July 26.....	10016	6.4	Aug. 24.....	10040	9.1
Aug. 7.....	10022	13	Aug. 29.....	10043	9.1
Do.....	10023	15	Aug. 31.....	10044	9.1
Aug. 8.....	10025	12			

<sup>23</sup> See Nelson (1924) for an account of rapid diurnal variations of pH in the estuarine waters of New Jersey.

<sup>24</sup> The use of the water glass is necessary to escape the effect of reflections from the surface.